ESQD Formula

For HC/D 1.1 mass detonating material, the blast effect is the primary hazard. Most distances required to protect structures from the effects of a shockwave/overpressure are based on the formula:

$$D = KW^{1/3}$$

D = distance in feet

K = a factor depending upon the risk assumed or permitted.

$W^{1/3}$ = cube root of the NEW in pounds

Math Refresher: 10^3 (ten cubed) = 10 X 10 X 10 = 1000

$1000^{1/3}$ (cube root of 1000) = 10

Blast Overpressure Permissible Exposures

DA Pam 385-64, Table 8-1, Safe Separation Distances and Expected Severities (HC/D 1.1)

Often times, the numerical K-factor is used interchangeably with the type of distance or level of protection it prescribes. Below is a list of permissible exposures stated in terms of psi, along with the corresponding K-factor and type of distance.

DISTANCE

Permissible Exposure Protection (PSI)	K-Factor	Distance Type
27	6	Barricaded Above-Ground Magazine Distance
12	9	Barricaded Intraline Distance
8	11	Unbarricaded Magazine Distance
3.5	18	Unbarricaded Intraline Distance
2.3	24	Public Traffic Route Distance (100,000 lbs NEW and below)
1.7	30	Public Traffic Route Distance (over 250,000 lbs NEW)
1.2	40	Inhabited Building Distnace (100,000 lbs NEW and below)